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Preserving third year medical students' empathy and enhancing self-reflection using small group "virtual hangout" technology

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Abstract

Background: Medical student professionalism education is challenging in scope, purpose, and delivery, particularly in the clinical years when students in large universities are dispersed across multiple clinical sites. We initiated a faculty-facilitated, peer small group course for our third year students, creating virtual classrooms using social networking and online learning management system technologies. The course emphasized narrative self-reflection, group inquiry, and peer support.

Methods: We conducted this study to analyze the effects of a professionalism course on third year medical students' empathy and self-reflection (two elements of professionalism) and their perceptions about the course. Students completed the Groningen Reflection Ability Scale (GRAS) and the Jefferson Scale of Empathy (JSE) before and after the course and provided anonymous online feedback.

Results: The results of the JSE before and after the course demonstrated preservation of empathy rather than its decline. In addition, there was a statistically significant increase in GRAS scores ($p < 0.001$), suggesting that the sharing of personal narratives may foster reflective ability and reflective practice among third year students.

Conclusion: This study supports previous findings showing that students benefit from peer groups and discussion in a safe environment, which may include the use of a virtual group video platform.

Introduction

Professional formation in medicine refers to personal growth and development into the professional role of a physician. Helping medical students achieve professional formation is now widely recognized as a central mission of medical education (Inui 2003). The Institute of Medicine (IOM) defines professional competencies that include reflective practice, self-awareness, self-regulation, peer learning, peer support, and team collaboration (IOM 2004; Birden et al. 2014). Similarly, the Liaison Committee on Medical Education (LCME) standards for medical education point to core professional attributes to be developed by trainees including altruism, compassion, and integrity (LCME 2013). However, research suggests that medical students entering the third year of training encounter a variety of stresses, including fragmentation of their learning environment (Hirsh et al. 2007; Bell et al. 2008), loss of empathy (DasGupta & Charon 2004; Newton et al. 2008; Hojat et al. 2009), and an informal or hidden curriculum that erodes empathy, contributing to burnout, and potentially degrades professional formation (Hafferty 1998; Inui 2003; Chen et al. 2007). One strategy for addressing these issues is to utilize peer small groups that are facilitated by trained faculty. Groups are designed for peer support and collaborative learning and

Practice points

- Professionalism education for third year medical students, using narrative self-reflection, group inquiry, and peer support, can help students meet the stresses of the "hidden curriculum".
- Social networking technology, coupled with an online learning management system, may be useful for professionalism training, particularly when class size is large and students are geographically dispersed.
- In our small group professionalism course, discussion themes included adaptation and stress; witnessing unethical or unprofessional behavior; burnout and resilience; and death, dying, and personal meaning.
- Measured before and after the course, students' scores on the Groningen Reflection Ability Scale increased overall in both sexes; scores on the Jefferson Scale of Empathy were unchanged.
- Asked what they liked most about the course, students most often stressed peer support, followed by the ability to talk about challenges of medical training, mentoring by faculty, and time for self-reflection.

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promote professional formation through self-reflection, inquiry, values clarification, problem solving, and positive faculty mentoring (Chou et al. 2011; Rosenthal et al. 2011; Treadway & Chatterjee 2011).

In 2011, Drexel University College of Medicine revised its professionalism graduation competencies to support professional attributes (Treadway & Chatterjee 2011). These competencies include upholding the primacy of patient welfare, with special attention to vulnerable populations; applying ethical principles of autonomy, beneficence, and social justice; committing to lifelong cultivation of compassion, self-compassion, and self-care; self-regulating emotions; committing to professional excellence; demonstrating honesty, integrity, reliability, and responsibility in clinical interactions; maintaining appropriate interpersonal boundaries; responding to observed breaches of professionalism; managing conflicts of interest; and projecting a professional image. In parallel to developing these competencies, we redesigned and expanded our longitudinal Professional Formation Curriculum, launching a new course for third year students in 2012 built around stable, longitudinal peer small groups that span all four years. This kind of curricular innovation faces the challenges of the large class sizes at Drexel, including in 2012 approximately 259 students dispersed among 23 different clinical sites across three states. Our strategy to overcome these class size and geographic issues was to utilize social networking technology coupled with an online learning management system.

Description of the educational program

Prior to this new course, professional formation small groups of not more than nine students initially formed during the first year of medical school. These groups continued to meet periodically in the second year and once in the fourth year. Historically, all meetings were on site at the main campus.

Student membership in the groups is relatively stable but faculty facilitators change with each new year. With this new course, these same professional formation groups were now able to meet throughout the third year.

Facilitators for this course were recruited among clinical faculty from a number of clinical sites with the stipulation that they were not directly involved in grading the students during their rotations. Faculty were given separate training and facilitator guides for each session outlining the goals, format, and suggestions for improving virtual facilitation.

We created virtual classrooms for 31 faculty-facilitated small groups using Google+ Hangout social networking technology (Google, Mountain View, CA), coupled with the online Blackboard learning management system (Blackboard, Washington, DC) on which to post course information and assignments. Students initially meet on campus at the beginning of the third year to review goals and objectives of the course, work through a tutorial on use of Google+ and Blackboard technology, and create small group ground rules to ensure effective group process and a confidential, safe learning environment. Groups then meet virtually every 8–12 weeks.

Each group has its own, private blog on Blackboard to which students post narrative responses to trigger questions in preparation for the small group sessions. Students are instructed to write about personally meaningful experiences (Figure 1). These brief self-reflections are read by students and faculty beforehand and are then discussed during the 75-min group session, providing an opportunity to explore and integrate these experiences in a safe learning environment (Novack et al. 1999). Session themes include adaptation and stress; witnessing unethical or unprofessional behavior; burn-out and resilience; and death, dying, and personal meaning. A major thematic component of the course is explicit engagement with the “hidden curriculum” of clinical training (Hafferty 1998) by using “just in time” learning that uses students’

STEP 1. Identify a personally significant experience that you have had in your clerkships using the theme of Adaptation and Stress as a third year medical student. Such an experience can be dramatic or subtle. It may appear extraordinary or mundane from the outside. It may have lasted for hours or for a few moments. These kinds of experiences are rarely the stuff of Hollywood or the evening news. What matters is that you choose an event that feels significant to you. Common examples are experiences that:

- Are challenging in some way—professionally, ethically, emotionally, socially, spiritually
- Take you to some personal limit—limit of what you knew, or of what you were ready for, or of what you believed to be true about yourself, other people, or the world
- Inspire, nurture, affirm
- Evoke a sense of awe

STEP 2. In 2–3 paragraphs, write about that experience using these 6 steps:

1. Description. Tell about what happened.
2. Response. What were your thoughts and feelings at the time?
3. Perspective of time. Now that you are reviewing the event, are there any details that you recall more clearly or that stand out in some new way?
4. Analysis. What made this a particularly strong event?
5. Choices. What other responses or actions might have been available to you at the time? What, if anything, might you have done differently?
6. Appreciate. What value can you take away from the experience? What did you learn or how did you grow?

Figure 1. Instructions for writing personal narratives for third year medical students in a professionalism small group course.

immediate experiences as a platform for discussion of professionalism (DasGupta & Charon 2004; Gaufberg et al. 2010).

Two important aspects of professionalism development are self-reflection and empathy (Epstein & Hundert 2002). The ability to self-reflect can help an individual deepen his or her personal and professional growth and problem solve in complex situations. We conducted this study to analyze the effects of the professionalism course described here on third year medical students' empathy and self-reflection and to learn from their perceptions about the course.

Methods

The study was approved by Drexel University's Institutional Review Board for Human Experimentation (University Protocol #1109000192).

All 259 third year students enrolled at the beginning of the 2012 school year at Drexel University College of Medicine were invited to participate in the study after we explained its purpose, which was to assess empathy and self-reflection among the students. We assured students that their anonymity was protected using a disinterested staff person to record their information (numbers were substituted for students' names, which were known only by the staff who entered the data) and that they could withdraw from the study at any time. (None officially withdrew.) Those who agreed to participate signed informed consent forms and completed the questionnaires.

Data collection

The Jefferson Scale of Empathy (JSE)

We assessed students' empathy using the JSE. This scale was developed to measure empathy among medical students, physicians, and health professionals and has been translated into 42 languages and used in more than 60 countries (Hojat 2007). The JSE comprises 20 items, rated by students on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). Scores can range from 20 to 140, and persons with a more empathic orientation obtain higher scores. Extensive data in support of the psychometrics of JSE have been reported (Hojat et al. 2002; Hojat 2007). Those data were collected through a self-administered questionnaire.

The Groningen Reflection Ability Scale (GRAS)

To assess self-reflection we used GRAS, which is a one-dimensional scale measuring ability for personal reflection. The GRAS has 23 items rated on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). GRAS scores can range from 23 to 115, and persons with higher personal reflection ability score higher. This scale has been validated for use in medical students and physicians (Aukes et al. 2007). Those data were also collected through a self-administered questionnaire.

Students completed the two questionnaires before (Time 1) and after (Time 2) the course. The pre-course questionnaires (Time 1) were administered during the introductory session of the course. Post-course questionnaires (Time 2) were administered by the faculty facilitator of each group, but some failed

to either distribute or collect the questionnaires, resulting in data loss. This fact resulted in fewer students in Time 2 data collection. The criteria for exclusion were the same in T1 and T2: not filling enough items of the scales or filling the scale in the same pattern (such as repeating the same number in all the items, even in those which should be reverted).

Students' feedback instruments

Anonymous end-of-course online feedback was required for completion of the course, which was graded as pass/fail based on attendance and submission of reflection exercises. Students were asked to respond to the following four items using a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree): (1) through small group preparation and participation, I enhanced my understanding of the personal challenges my peers and I face during medical training; (2) the small group contributed to my ability to anticipate and respond to the challenges of medical training; (3) time allotted for the small group session was appropriate; and (4) the technology and logistics for the virtual small group session worked well. Free text comments were solicited as well.

Two open-ended feedback questions were as follows: (1) What did you like most about the course? and (2) What would you like to change about the course? We collected these answers anonymously through the online learning system.

Data analysis

We computed descriptive statistics with frequencies, means, standard deviations (SD), and 95% confidence intervals (CI) for means. We used independent-samples Student *t*-tests to compare all participants' GRAS and JSE mean scores in Time 1 and Time 2 by sex. Paired Student *t*-test was used to compare differences from Time 1 to Time 2 in the participants who completed the scales in both periods. The null hypothesis was rejected when $p < 0.05$. To measure the effect size, we used Cohen's *d* (calculated by subtracting $\text{mean}_{\text{group1}}$ from $\text{mean}_{\text{group2}}$, divided by pooled SD), and we interpreted the η^2 values as follows: 0.01 = small effect, 0.06 = moderate effect, and 0.14 = large effect (Cohen 1988).

We analyzed responses to the open-ended questions using thematic content analysis. The two investigators who coded responses first analyzed them independently, then organized them in categories and looked for emerging themes. Afterwards, those investigators compared their findings, kept the consensual ones, and discussed the others until they reached agreement.

Results

The mean age of participants was 26.0 years (SD = 2.8 years) and there were no significant age differences between the sexes ($p > 0.05$). Mean JSE and GRAS scores of all the participants in Time 1 and in Time 2 by sex are shown in Table 1. Although GRAS scores increased overall in both sexes, JSE scores were unchanged. When only the participants who completed the scales in both periods (Time 1 and Time 2) were analyzed (Table 2), the same trends occurred.

Table 1. Scores on the Groningen Reflection Ability Scale and Jefferson Scale of Empathy by sex among all participants (third year medical students, Drexel University College of Medicine 2012).

	Groningen Reflection Ability Scale		Jefferson Scale of Empathy	
	Time 1	Time 2	Time 1	Time 2
Men, <i>n</i>	126	67	126	65
Mean score (SD)	89.8 (8.0)	94.1 (8.7)	111.5 (11.7)	113.4 (14.0)
95% CI for mean	88.4, 91.2	92.0, 96.2	109.4, 113.6	109.9, 116.8
Women, <i>n</i>	123	62	123	60
Mean score (SD)	90.4 (8.2)	94.2 (8.3)	115.1 (10.0)	117.3 (12.3)
95% CI for mean	88.9, 91.8	92.1, 96.3	113.3, 116.8	114.1, 120.5
Total, <i>n</i>	249	129	249	125
Mean score (SD)	90.1 (8.1)	94.2 (8.5)	113.3 (11.0)	115.2 (13.3)
95% CI for mean	89.1, 91.1	92.7, 95.6	111.9, 114.6	112.9, 117.6

CI, confidence interval; SD, standard deviation.

Table 2. Mean scores on the Groningen Reflection Ability Scale and the Jefferson Scale of Empathy among participants who completed the scales in Time 1 and Time 2 (third year medical students, Drexel University College of Medicine 2012).

	Groningen Reflection Ability Scale		Jefferson Scale of Empathy	
	Time 1	Time 2	Time 1	Time 2
Men, <i>n</i>		67		65
Mean score (SD)	90.0 (8.0)	94.1 (8.7)	113.7 (11.9)	115.3 (13.3)
Paired <i>t</i> test, <i>t</i>		4.3		1.8
<i>p</i> value		<0.001		>0.05
η^2		0.2		
Women, <i>n</i>		62		60
Mean score (SD)	91.2 (8.7)	94.2 (8.3)	115.7 (11.0)	117.3 (12.3)
Paired <i>t</i> test, <i>t</i>		3.5		1.28
<i>p</i> value		<0.001		>0.05
η^2		0.16		
Total, <i>n</i>		129		125
Mean (SD)	90.5 (8.3)	94.2 (8.5)	113.7 (12.0)	115.2 (13.3)
Paired <i>t</i> test, <i>t</i>		5.6		1.8
<i>p</i> value		<0.0001		0.07
η^2		0.2		–

SD, standard deviation.

Student feedback

Students stated repeatedly that the peer group was a valuable experience. Of the 240 students who provided online feedback, 70% (*n* = 168) agreed or strongly agreed that the small group enhanced their understanding of the challenges they and their peers face during medical training. Sixty-six percent of small group participants noted that the group was a source of social support (*n* = 158) and 48% (*n* = 115) stated it that “contributed strongly to their ability to anticipate and respond to challenges of medical training”.

Post-course narrative feedback reflected the students’ perspectives and aspects of the course that resonated with them during their clerkship experiences. Asked what they liked most about the course, students mentioned peer support,

the ability to talk about challenges of medical training, mentoring by faculty, and time for self-reflection.

Peer support

Peer support was by far the most common positive theme for this course. Students appreciated seeing the “familiar faces” of peers whom they had known for over two years and catching up with each other at the start of each session. Of the 240 student comments, 74% (*n* = 177) addressed the peer–peer interaction, while only 9% (*n* = 22) commented on the helpfulness of a faculty mentor/facilitator in the group.

Opportunity to share and explore challenges of medical training

Students recorded how comfortable they felt sharing stories and ideas on how to cope with stressful situations. The items grouped in this section included gaining a sense of normalization in relation to difficult experiences, appreciating being heard or acknowledged, and gaining insight into coping strategies and solutions. Ten percent of the responses (*n* = 24) specifically noted that the topics explored in each session were helpful.

Self-reflection

The blogs or short narratives that students wrote for each session allowed them a venue for self-reflection and ability to think about a stressful event or situation. The blogs were shared in the small group verbally and in writing. Faculty read these blogs and facilitated the small group according to themes within their individual groups. A minority of students (6%) commented specifically on the narrative/blogs (*n* = 14) as a useful exercise.

Themes on course improvement

Technology problems were mentioned in 102 (43%) of comments about course improvement. These issues generally related to unstable or poor Internet connectivity at remote clinical sites, and also institutional firewalls that prevented access to the Internet. Nineteen percent (*n* = 46) felt that the written reflection should be eliminated. This is consistent with research suggesting that students appreciate reflection but may prefer verbal over written self-expression (Fagan et al. 2012). A third major theme (16%; *n* = 38) was feedback that group sessions should not be scheduled on days prior to shelf exams.

Discussion

A national movement is underway to enhance professionalism training for medical students, with particular attention to the need to address the “hidden curriculum” in the clinical years (Hafferty 1998; Inui 2003; Murinson et al. 2010). This hidden curriculum refers to the informal and continuous exposure to professional role-modeling and value transmission that is often negative and contradictory to guiding principles and commitments. A growing number of strategies for addressing the hidden curriculum include making the hidden visible through open conversation, inquiry and reflection; preparing students to respond appropriately when exposed to clinical or

educational unprofessional behavior. Stable, supportive peer groups and continuity of quality faculty mentorship are additional, important strategies (Chou et al. 2011) but implementation is enormously challenging for schools such as Drexel that have large numbers of students who are dispersed across multiple clinical sites. The use of social networking and online learning management system technologies provides a workable solution to create stable, faculty-facilitated small groups in which students examine, process, and explore responses to negative dimensions of the hidden curriculum while also appreciating and validating positive role models and their own formation as caring physicians.

Pre-/post-JSE scores point to a preservation of empathy in our students, a finding that is notable given reports of empathy erosion among third year medical students (Neumann et al. 2011). In addition, GRAS scores demonstrate an increase in capacity for personal reflection among this cohort who had practice with written reflection and group inquiry throughout the year. Narrative student feedback revealed that medical students appreciate a platform for exploring challenging issues with peers. This study supports previous findings showing that students benefit from peer groups and discussion of professionalism issues in a safe environment (Chou et al. 2011; Rosenthal et al. 2011).

We suspect that by reducing feelings of isolation, we lessen burnout from unresolved situations and stress that medical students encounter during their third year. Research has shown that depression in physicians begins early in medical school and can lead to burnout, medical errors, and attrition (Dyrbye et al. 2006). We plan to study the effects of this educational intervention on student burnout in the future.

Although virtual platforms for small group engagement have limitations, overall students are very facile with technology and adapted easily to the platform. Faculty had a slower learning curve. Although educational videos, written documentation, and workshops were used to support faculty mastery of Google+ and Blackboard, many faculty members required extensive, one-on-one training. We managed information technology (IT) issues by having a volunteer student assigned as the "IT champion" for each group. This individual started the Google "hangout" and was the contact for any IT issues with that group. Having one person per group assigned to this function helped target issues and allowed us to manage groups centrally. Still, most of the negative feedbacks about the course from students and faculty focused on technology problems. We hope that our ability to manage the technology challenges will improve as new platforms are created and more hardwiring of the satellite campuses occurs.

Our study has several limitations. First, we report on the experience of a single institution. Second, the poorer response rate on our posttest may have resulted from the way instruments were administered and collected. We were not able to perform subgroup analyses to determine which students might benefit most from this educational intervention, and our study did not determine which elements of the intervention were most important. Because we did not have a control group, we do not know whether preservation of empathy was related to this particular course or to other institutional changes or variables. We would like to evaluate

this program at other schools to determine whether its apparent benefits are generalizable. Also, in any self-reported survey, social desirability bias is possible. However, this is not highly likely in this study because of the nonpenalizing testing situation. In the future, we hope to look more carefully at students' perspectives and to add more self-assessment questions about which aspects students perceived helped them to preserve their empathy and improve their resilience skills. In addition, we need to look carefully at the pressures students experience during the third year to better understand which aspects of medical education erode professionalism and which support professional development.

Glossary

The Groningen Reflection Ability Scale: The Groningen Reflection Ability Scale is a written survey for assessing an individual's ability for personal reflection. Respondents rate 23 items on a 5-point Likert scale (from 1, "strongly disagree" to 5, "strongly agree"). Scores may range from 23 to 115; higher scores denote higher personal reflective ability.

Reference: Aukes LC, Geertsma J, Cohen-Schotanus J, Zwierstra RP, Slaets JP. 2007. The development of a scale to measure personal reflection in medical practice and education. *Med Teach* 29:177–182.

Hidden curriculum: The "hidden curriculum" in medical education refers to the lessons students may learn from observing faculty, residents, and other physicians in their daily interactions with patients and each other, as opposed to the "formal" curriculum students learn in the classroom.

Reference: Hafferty F. 1998. Beyond curriculum reform: confronting medicine's hidden curriculum. *Acad Med* 73:403–407.

Just-in-time learning: "Just-in-time" learning is a teaching method structured via online learning management system technologies. Using the system, students are prompted to answer questions related to an upcoming class shortly before the class time.

Reference: Simkins S, Maier M, Rhem J, editors. 2010. *Just in time teaching: Across the disciplines, and across the academy (new pedagogies and practices for teaching in higher education)*. Sterling, VA: Stylus Publishing.

Virtual classroom: A virtual classroom uses Web- or software-based tools for remote or distant learning, usually providing for student/teacher and student/student interactions in real time. Technologies may include Web or video conferencing, livestreaming of lectures, podcasts, or other content, e-mail, and message and "chat" capabilities such as "tweetchat".

Reference: Virtual classroom. 2014. Dictionary.com's 21st century lexicon. [Accessed 7 April 2014]. Available from: <http://dictionary.reference.com/browse/virtual-classroom>.

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